Spring 2022 EE214 Experiment 1
Diodes and Rectifiers

Ahmet Akman 2442366
Yusuf Toprak Yıldıran 2444149

April 1, 2022

Contents

1 Introduction

In this experiment , characteristics of different diodes ,and rectifiers are investigated. First the i-v characteristics of 3 different diodes are expected to be oobserved. Then, the behavior of the half wave is expected to be experimented. Lastly, observations are made on clamper and zener regulator circuits. The results of the experimentation is presented in this document.

2 Experimental Results and Discussion

The results of the experiment are discussed in following steps.

2.1 Step 1

In this step, the circuit schematic given in Figure TODO is constructed on breadboard. As the signal supply, analog signal generator is used for floating output.

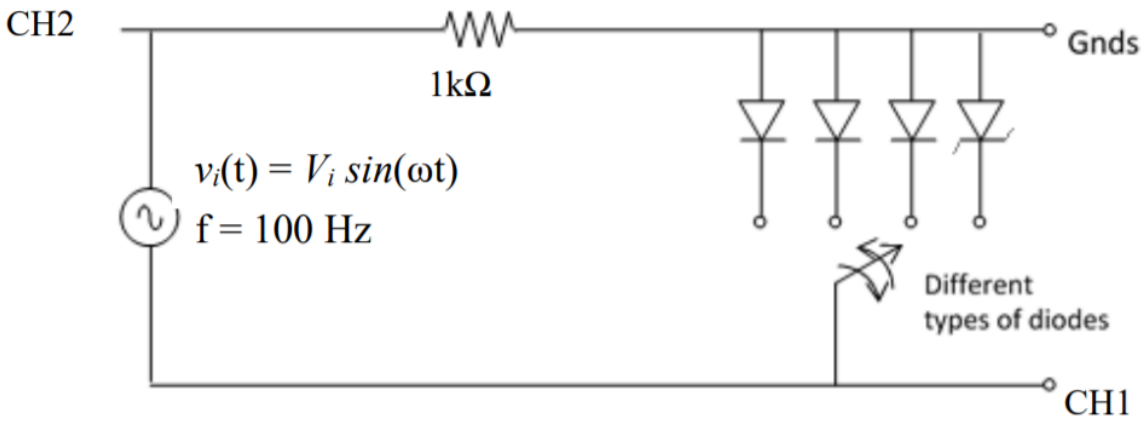

Figure 1: Circuit schematic for the step 1

2.1.1 a)

The diode models, AA119,hrefhttps://www.vishay.com/docs/88536/ba157.pdfBA159 ,and BZX55C-6V2 are used. The probes of the oscilloscope is connected to the nodes indicated in Figure TODO. The resulting graph is plotted as given in Figure TODO2 TODO3 ,and TODO 4 for AA119,hrefhttps://www.vishay.com/docs/88536/ba157.pdfBA159 ,and BZX55C-6V2 respectively.

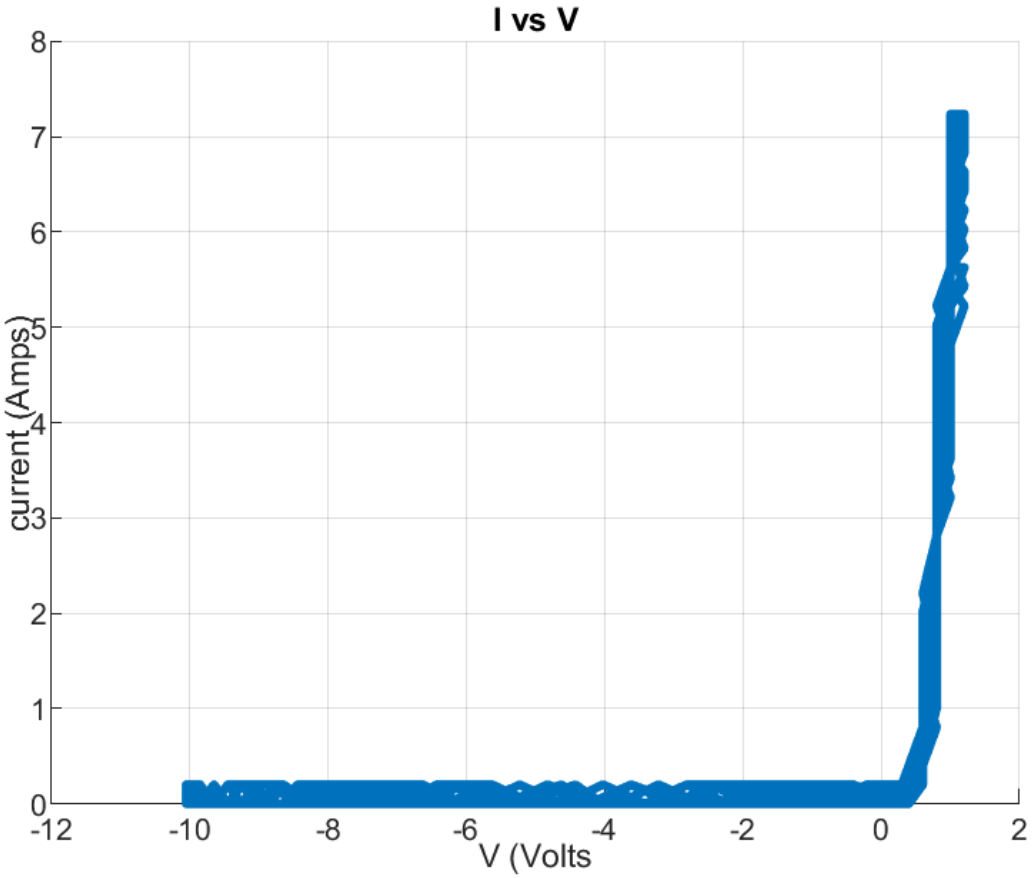

Figure 2: i-v characteristics of AA119

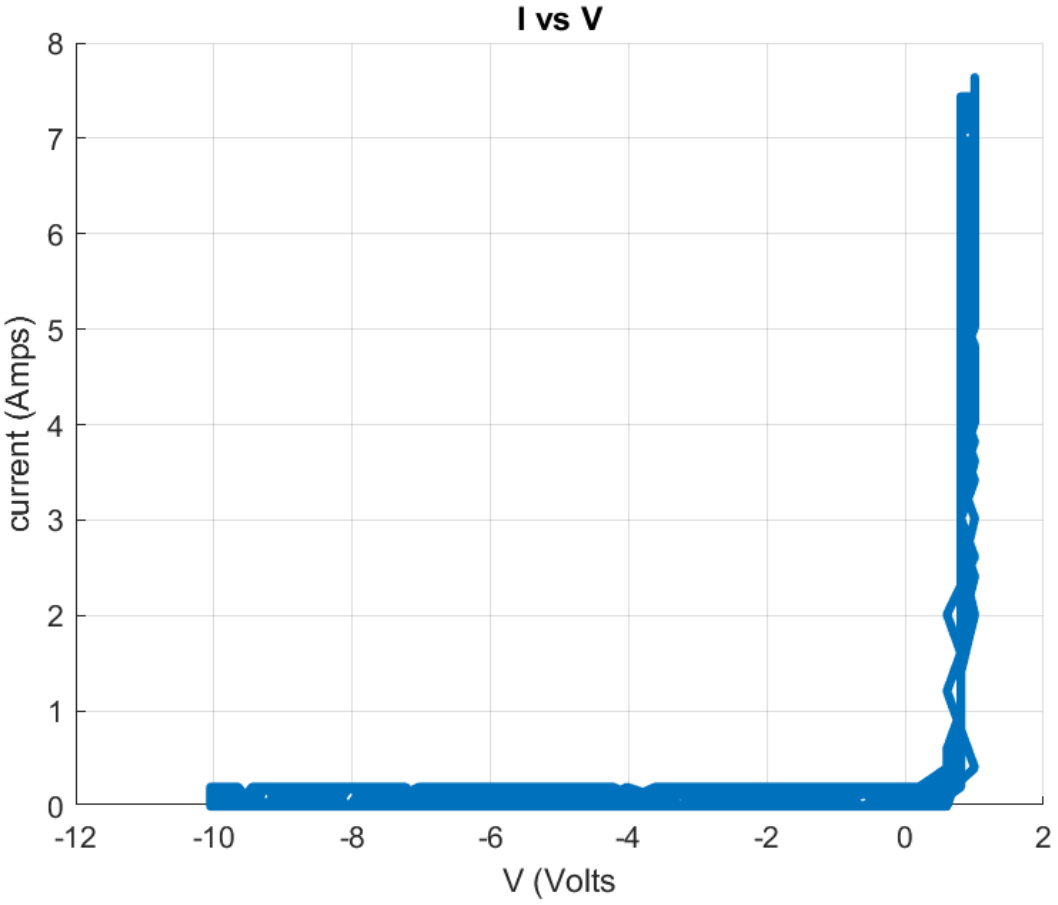

Figure 3: i-v characteristics of BA159

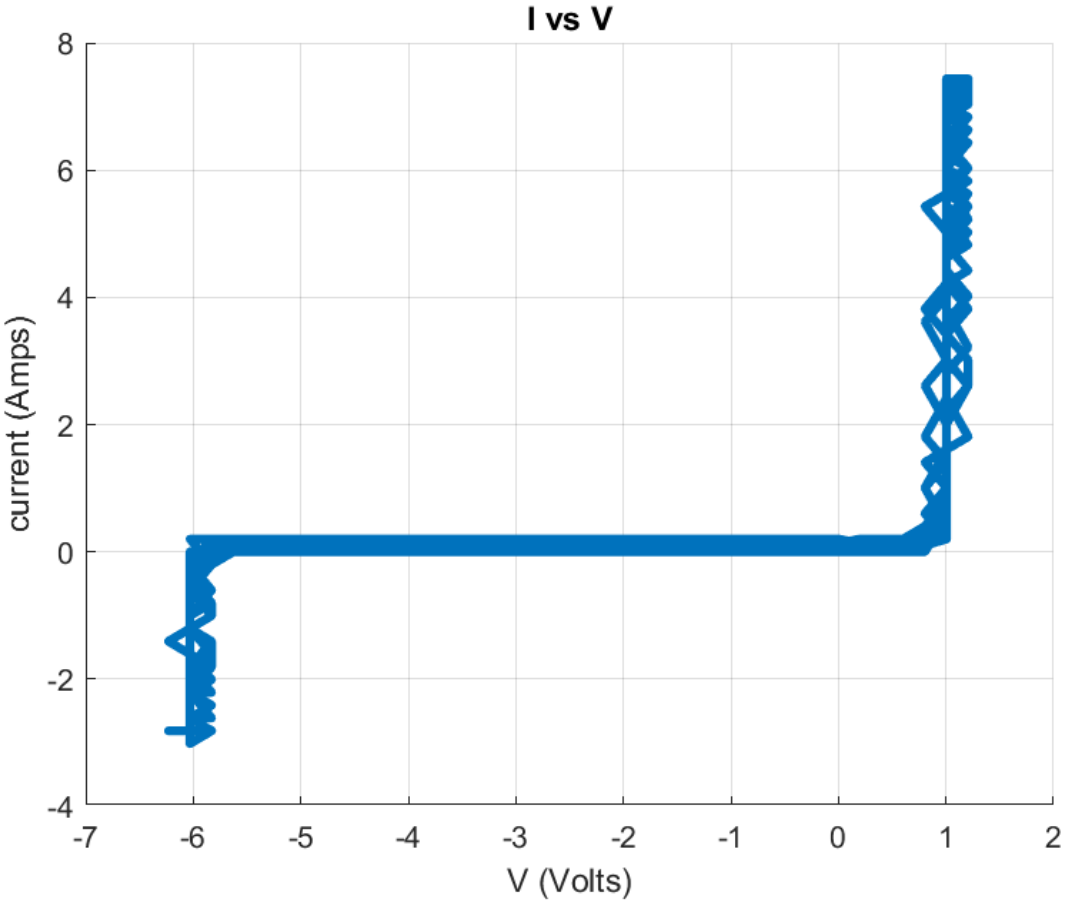

Figure 4: i-v characteristics of BZX55C-6V2

Using those plots the piecewise parameters of the diodes are obtained by the virtue of the cursors of the oscilloscope. The parameters of diode AA119 is given in Table 1.

Table 1: Piecewise parameters of diode AA119

V_{on}	350 mV
r_f	0.17 Ω
r_r	86 Ω

The obtained parameters of diode AA119 is given in Table 2.

Table 2: Piecewise parameters of diode BA159

V_{on}	973.5 mV
r_f	0.625 Ω
r_r	86.2 Ω

The obtained parameters of diode BZX55C-6V2 is given in Table 3.

Table 3: Piecewise parameters of diode BZX55C-6V2

V_{on}	752 mV
V_z	5.92V
r_f	0.05 Ω
r_r	0.156 Ω

So, the pimple i-v characteristics of 3 different diodes are obtained ,and analyzed using the plot.

2.1.2 b)

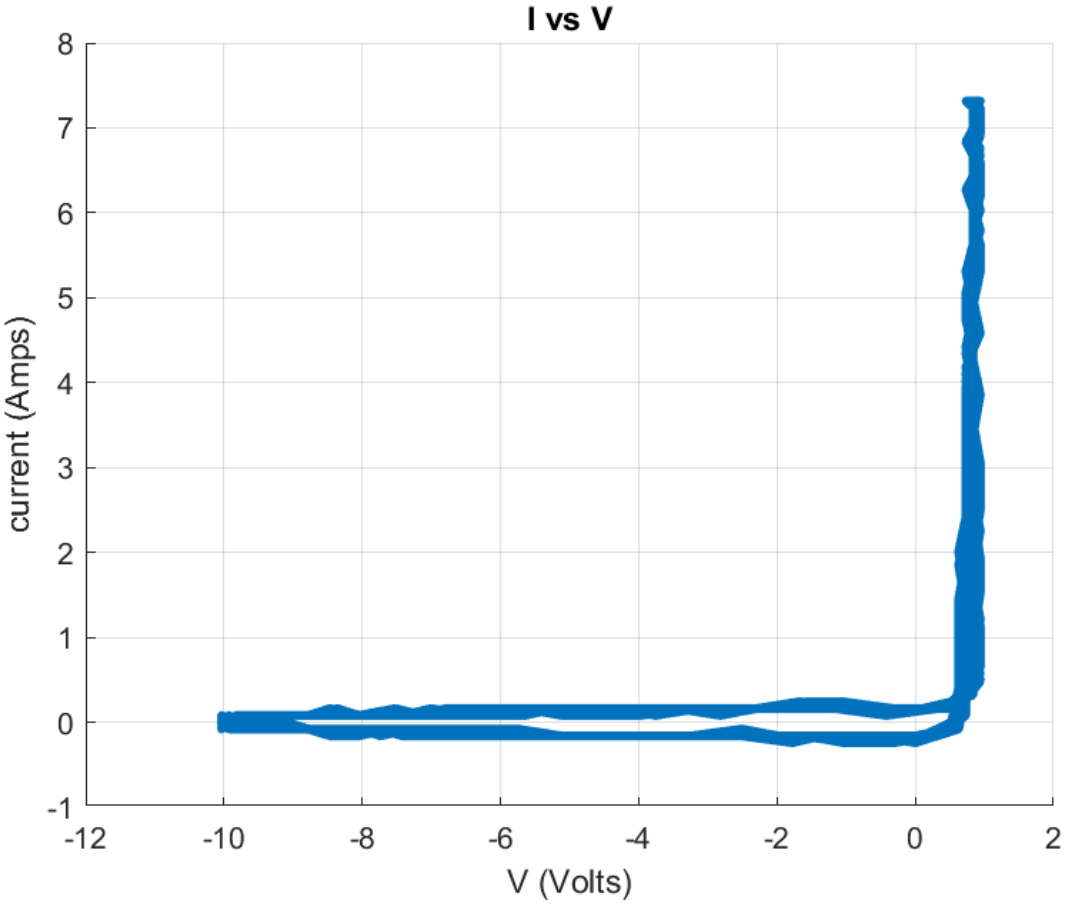

Figure 5: i-v characteristics of BA159 at 10khz

2.2 Step 2

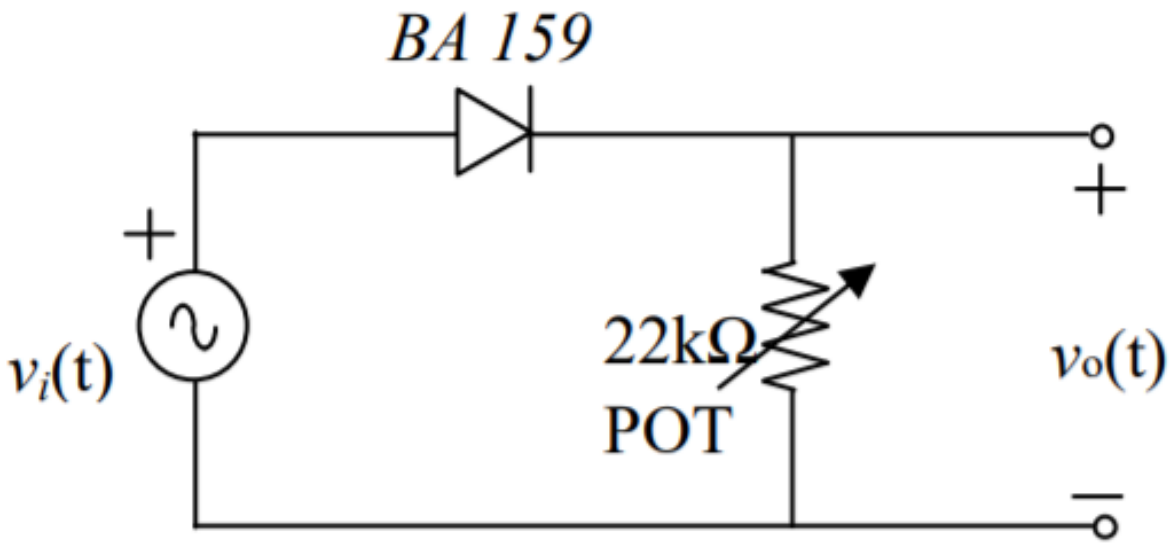

Figure 6: Circuit schematic for the step 2

2.2.1 a)

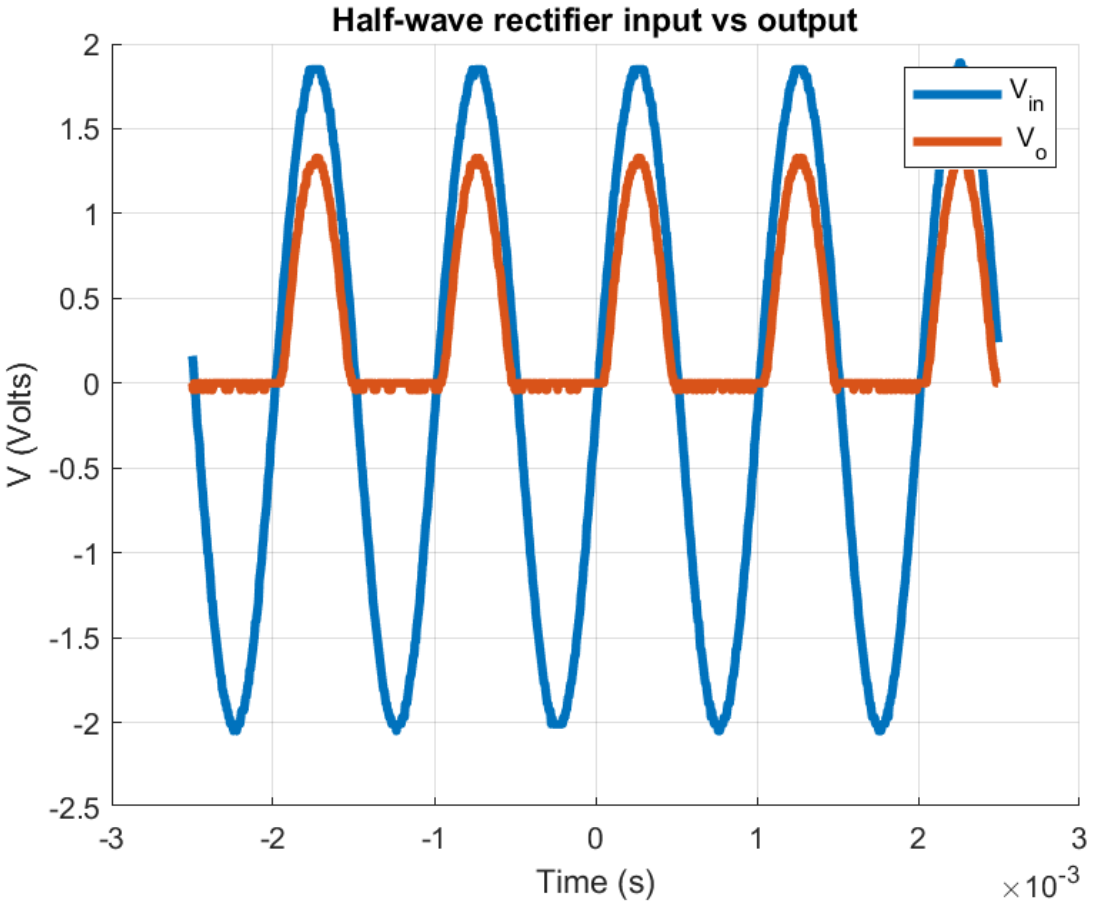

Figure 7: Half-wave rectifier with BA159

2.2.2 b)

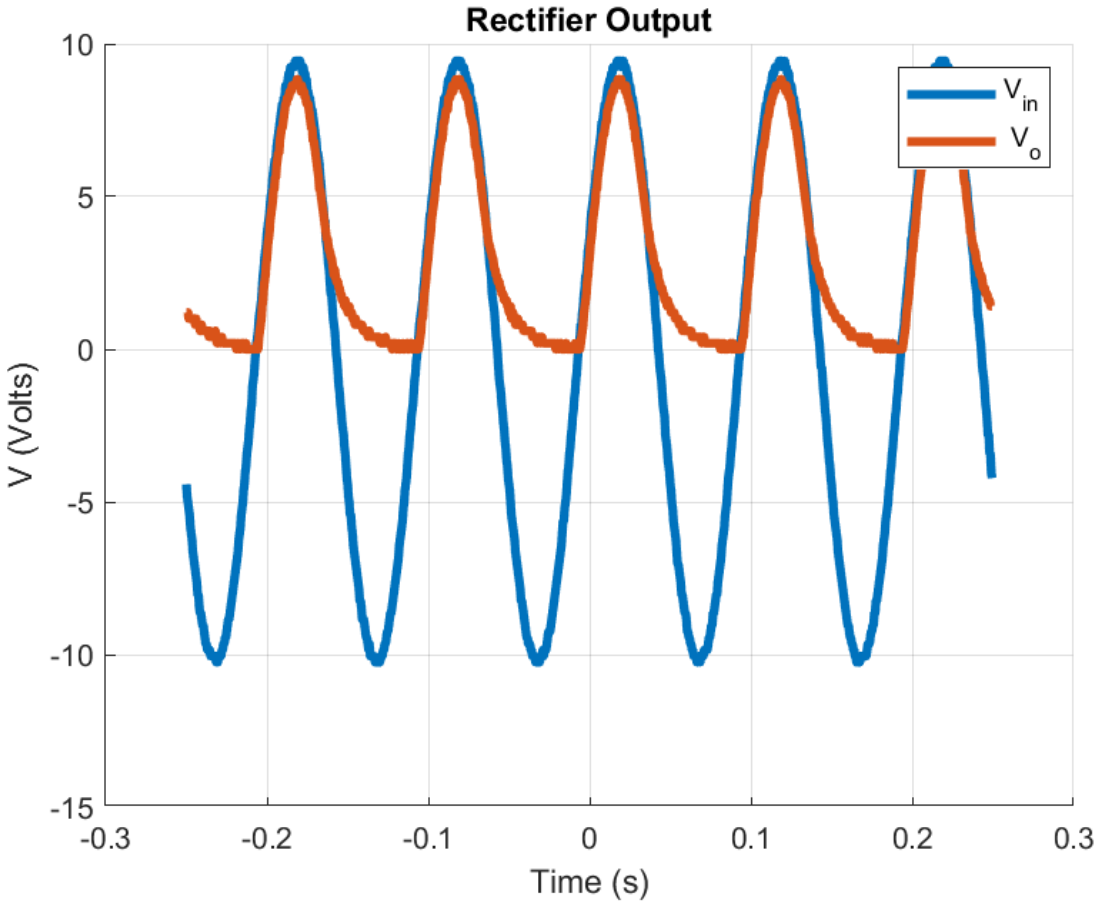

Figure 8: Half-wave rectifier with BA159 with pot set to 1.2K Ω

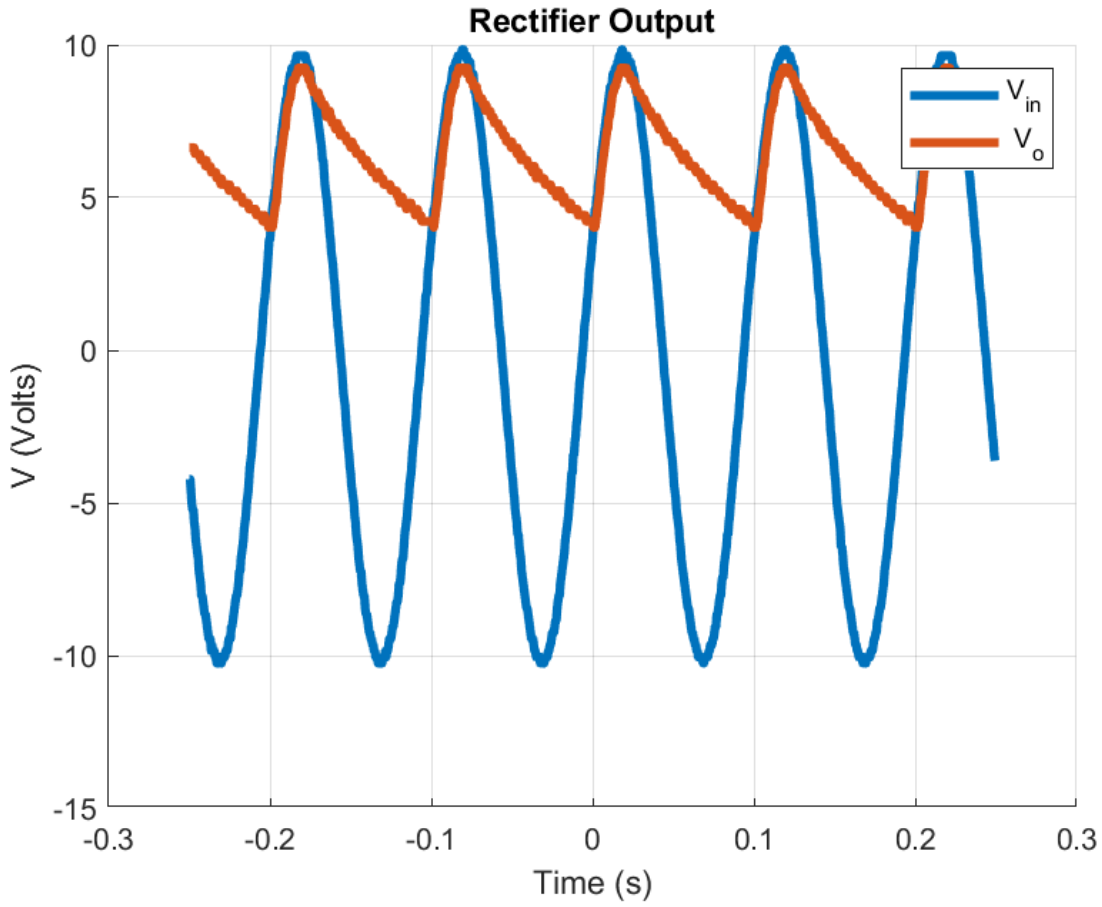

Figure 9: Half-wave rectifier with BA159 with pot set to 10K Ω

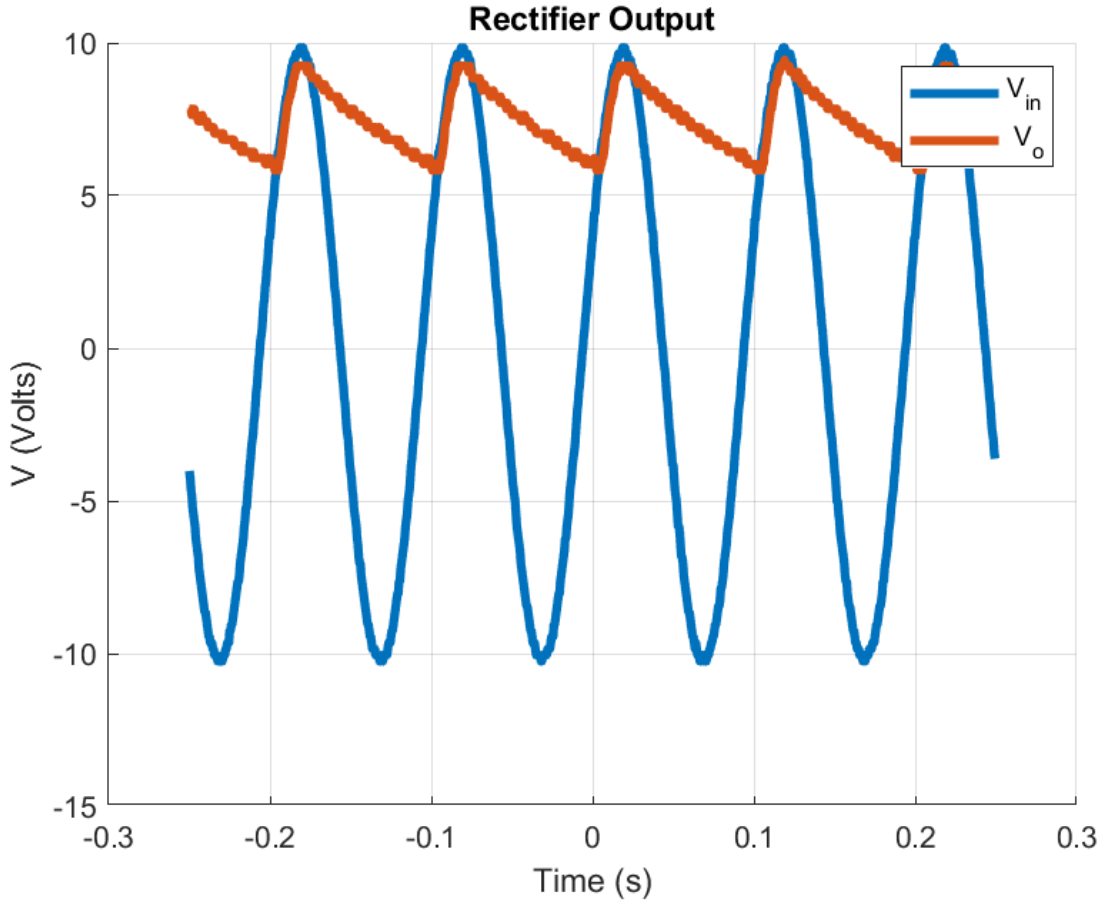

Figure 10: Half-wave rectifier with BA159 with pot set to 18K Ω

2.3 Step 3

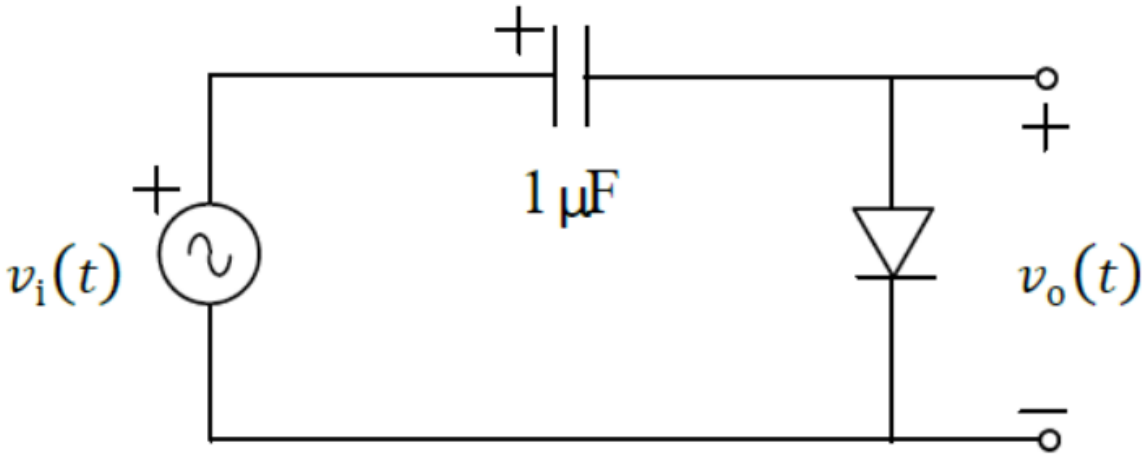

Figure 11: Circuit schematic for the step 3

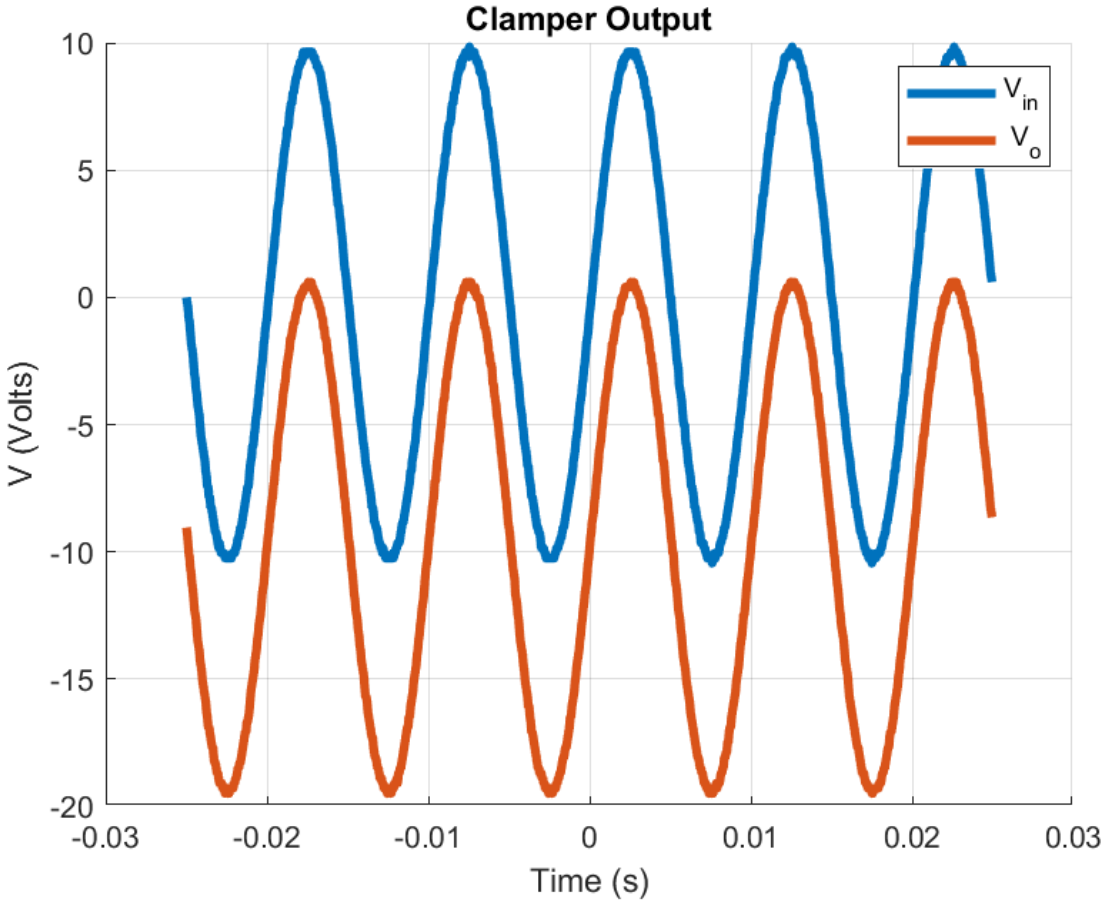

Figure 12: Clamper circuit output

2.4 Step 4

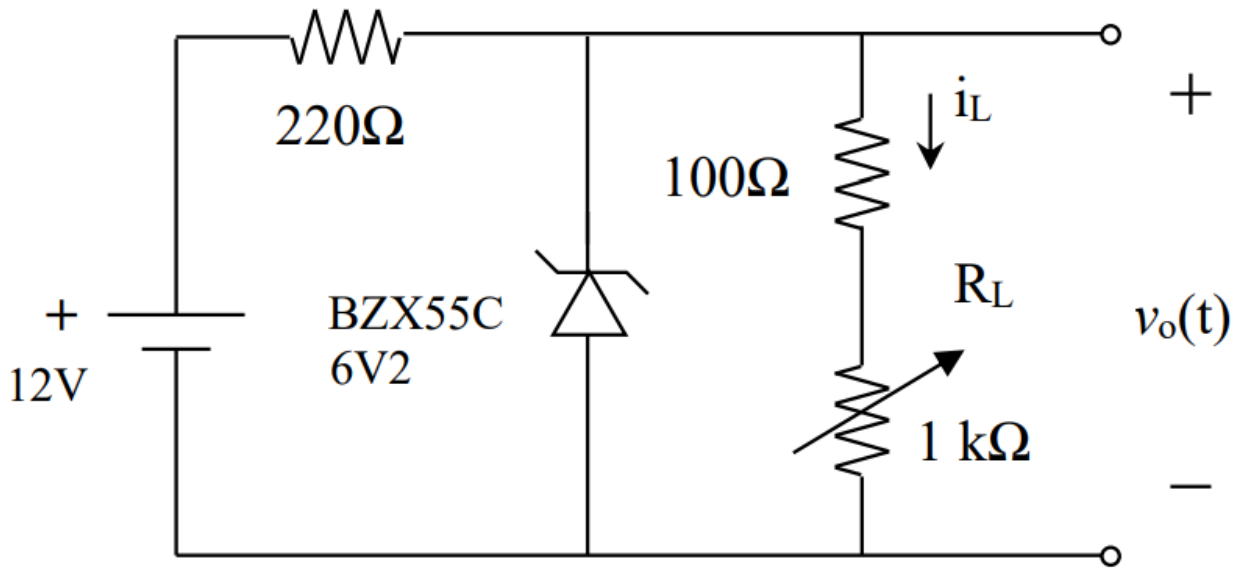

Figure 13: Circuit schematic for the step 4

3 Conclusion

asdfd

Appendix A

- PreLab Preprataion 6 hours
- Experimental Work 2 hours
- Report Writing 6 hours